PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
Thomas B. Carlson

Serial No.: 09/788,334

Filed: February 16, 2001

For: PLANTS AND SEEDS OF CORN VARIETY I015011

Group Art Unit: 1638

Examiner: Mehta, A.

Atty. Dkt. No.: DEKA:282US/REH

CERTIFICATE OF MAILING
37 C.F.R. §1.8

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Robert E. Hanson

BRIEF ON APPEAL

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BRIEF ON APPEAL

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Commissioner for Patents
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Sir:

Appellants hereby submit an original and two copies of this Appeal Brief. The fee for filing this Appeal Brief is attached hereto. This Brief is filed pursuant to the Notice of Appeal mailed April 23, 2003. The date for filing the instant Brief is June 30, 2003, based on the receipt of the Notice of Appeal by the Patent and Trademark Office on April 28, 2003 and 37 C.F.R. §1.7. No additional fees are believed due in connection with the instant paper. However, should any fees be due, the Commissioner is authorized to withdraw the appropriate fee from Fulbright & Jaworski L.L.P. Deposit Account No. 50-1212/DEKA:282US. Please date stamp and return the enclosed postcard to evidence receipt of this document.

I. REAL PARTIES IN INTEREST

The real party in interest is Monsanto Company, the parent of wholly-owned subsidiary DeKalb Genetics Corporation, the assignee of this application.

II. RELATED APPEALS AND INTERFERENCES

An appeal was filed in U.S. Patent Application Ser. No. 09/772,520, which contains substantially similar claims and issues on appeal and therefore may have a bearing on the Board's decision in the pending appeal. An appeal was also filed in U.S. Patent Application Ser. No. 09/606,808, which claims an inbred corn plant variety and was subject to similar types of rejections as the instant case, but has a number of different claims on appeal and the substance of the rejections at issue differs.

III. STATUS OF THE CLAIMS

Claims 1-31 were filed with the application and were pending at the time of the final Office Action. Claims 1, 2, 5-13 and 15-20 were allowed in the final Office Action and claims 3, 4, 14, 21 and 24-31 were rejected. Claim 4 has been cancelled in an amendment under 37 C.F.R. §1.116 filed concurrently herewith as being duplicative of the claim from which it depends. The appeal of this claim has thus been withdrawn. No other claims have been canceled. Claims 1-31 were thus pending prior to the entry of the 116 amendment and claims 1-3 and 5-31 pending after entry of the amendment. Claims 3, 14, 21 and 24-31 are the subject of the instant appeal. A copy of the appealed claims after entry of the amendment under 37 C.F.R. §116 is attached hereto as Appendix 1 and a copy of the pending claims after entry of the amendment is attached as Appendix 2. A copy of the appealed claims without the entry of the amendment is attached as Appendix 3.

IV. STATUS OF AMENDMENTS

An amendment under 37 C.F.R. §1.116 is being filed concurrently herewith. No other amendments were made subsequent to the final Office Action.

V. SUMMARY OF THE INVENTION

The invention relates to the novel inbred corn plant designated I015011 and seeds or populations of seed thereof. Specification at page 5, lines 5-22. The invention also relates to single locus converted plants of I015011. Specification at page 6, lines 12-21. The invention further relates to methods for breeding I015011 with other corn plants, and hybrid plants produced thereby. Specification from page 7, line 23 to page 9, line 16.

VI. ISSUES ON APPEAL

(1) Are claims 3, 14 and 21 properly rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out the subject matter which applicants regard as the invention?

(2) Are claims 3, 14, 21 and 24-31 properly rejected under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to convey that the applicants were in possession of the claimed invention?

VII. GROUPING OF THE CLAIMS

Claim 3 is directed to an essentially homogeneous population of seed of corn variety I015011, while claim 14 is directed to an essentially homogeneous population of corn plants produced by growing the seed of corn variety I015011. The analysis of issues on appeal for these claims turns on the meaning of "essentially homogeneous," and thus the claims stand or fall together but separately from the remaining claims, which are directed to distinct subject matter with different issues on appeal. Independent claim 21 is directed to a process of producing corn seed comprising crossing first and second corn plants, whereas claims 24-26 are directed to hybrid plants produced by certain embodiments of this process. Process and product claims present different issues for the analysis of written description under 35 U.S.C. §112 and

thus claims 21 and 24-26 each stand or fall separately from the remaining claims on appeal. Claims 24-26 stand or fall together. Claims 27-30 are directed to a corn plant of variety I015011 which comprises a single locus conversion and, therefore, these claims stand or fall together. Claims 27-30 stand or fall separately from the remaining appealed claims, as the rejection of only these claims centers on whether written description has been provided for a "single locus conversion" of corn plant I015011, and the issue is distinct from other issues on appeal. Another appealed independent process claim is present in the case in addition to claim 21, claim 31, but comprises a distinct series of steps from claim 21, and thus presents different written description issues on appeal. The claim stands or falls separately from both claim 21 and the remaining claims.

VIII. SUMMARY OF THE ARGUMENT

The indefiniteness rejections fail because the metes and bounds of the claim are fully definite. The term "essentially homogeneous" has been properly used in claims 3 and 14 to further define populations of seed of corn variety I015011 and a population of corn plants produced by growing the seed of the corn variety I015011. The examiner alleges that the term is indefinite because it fails to further narrow and/or broadens the term "population." However, as established by the dictionary meanings for the terms "population" and "homogeneous," a population need not be homogeneous. The term therefore further defines the subject matter of the claims and is not indefinite. The examiner also alleges that claim 21 is indefinite because it uses the term "comprising" and thus could include an unlimited number of additional steps envisioned by the examiner. The rejection is essentially a *per se* rejection of the use of the open-ended transition "comprising" based on hypothetical scenarios. The rejection fails because

nothing is indefinite in the use of the transition "comprising" regardless of additional components or steps that could allegedly be envisioned to infringe.

The written description rejections fail because the claimed subject matter has been adequately described. Each of the claimed hybrid plants and seeds having inbred corn plant I015011 as one parent have as half of their genome the same genetic contribution from I015011, given that corn plant I015011 is inbred. This structural characteristic is readily detectable and thus defines the claimed plants. These plants can be produced using any second plant, thus written description with regard to the other parent is satisfied based on the countless corn varieties known to those of skill in the art, including the more than 300 corn varieties for which utility patents have previously been issued. Methods of crossing the claimed corn variety have been fully described in the recited steps, and such corn breeding steps were well known in the art. Single locus conversions of I015011 are also fully described, in that well more than a representative collection of single locus conversion traits are described in the specification and were well known to those of skill in the art. The single locus conversion traits themselves are further not being claimed, rather it is corn plant I015011 comprising any given single locus conversion that is claimed.

IX. ARGUMENT

The Examiner has finally rejected claims 3, 4, 14 and 21 under 35 U.S.C. §112, second paragraph, as being indefinite, and claims 3, 4, 14, 21 and 24-31 under 35 U.S.C. §112, first paragraph, as allegedly lacking an adequate written description in the specification. Applicants respectfully request that the Board reverse the rejections for the reasons set forth below.

A. The Rejections Under 35 U.S.C. §112, Second Paragraph, Were Improperly Maintained

1. Rejection of claim 3

The Examiner finally rejected claims 3 and 4 as allegedly broadening the claims from which they depend. Claim 4 has been canceled and thus the rejection is now moot. With respect to claim 3, it is noted that the claim does not broaden the scope of the claim from which it depends, claim 2. Claim 2 reads as follows:

> 2. A population of seed of the corn variety I015011, wherein a sample of the seed of the corn variety I015011 was deposited under ATCC Accession No. PTA-3228.

Claim 3 specifies the population of seed of claim 2, "further defined as an essentially homogeneous population of seed." Claim 3 thus further defines the population of claim 2 as being "essentially homogeneous." While claim 2 is directed to a population of seed of the corn variety I015011, it is not necessary that the population be an essentially homogeneous population of seed. A population may not be essentially homogeneous yet still be a population. For example, the relevant definition of "population" from the on-line version of the Merriam-Webster™ dictionary is "a body of persons or individuals having a quality or characteristic in common." Exhibit A. In contrast, the definition for "homogeneous" from the same on-line dictionary is given as "of uniform structure or composition throughout." Exhibit B. Therefore a collection of seed may at one time have a quality or characteristic in common, *e.g.*, be of variety I015011, yet not be of uniform structure or composition throughout. For example, a population of seed of corn variety I015011 could be non-uniform in size or shape, due to growth or other conditions, yet still have the common quality of being a corn plant of variety I015011. As such, claim 3 is in proper dependent form and is not indefinite. Reversal of the rejection is thus respectfully requested.

2. Rejection of claim 14

The Examiner has also maintained the rejection of claim 14 as being indefinite for reciting the term "essentially homogeneous population." Claim 14 reads as follows:

> 14. An essentially homogeneous population of corn plants produced by growing the seed of the corn variety I015011, wherein a sample of the seed of the corn variety I015011 was deposited under ATCC Accession No. PTA-3228.

Appellants again note that, as set forth above, a population need not be essentially homogeneous, whether a population of plants or seeds. Further defining a population as essentially homogeneous does not render the claim indefinite. A population of plants grown from the seed of corn variety I015011 could vary in size or other characteristics due to environmental or other conditions, but still constitute a population of corn plant produced by growing the seed of corn variety I015011. As such, "essentially homogeneous" further defines the scope of the claim and the term as it is used is not indefinite. Reversal of the rejection is thus respectfully requested.

3. Rejection of claim 21

The Examiner has finally rejected claim 21 as allegedly not specifying how many crosses are performed. In particular, the examiner appears to argue that claim 21 uses the term "comprising" and thus could allegedly include a non-recited number of additional steps envisioned by the examiner. Claim 21 reads as follows:

> 21. A process of producing corn seed, comprising crossing a first parent corn plant with a second parent corn plant, wherein one or both of the first or the second parent corn plant is a plant of the corn variety I015011, wherein a sample of the seed of the corn variety I015011 was deposited under ATCC Accession No. PTA-3228, wherein seed is allowed to form.

The rejection that has been made appears to be a *per se* rejection of the use of the open transition "comprising," as no essential steps have been alleged to be absent. The rejection made would apply to any use of open language, because certain steps could allegedly be added to any

claim in which "comprising" is used. That is, anytime "comprising" is the transition, as in the overwhelming majority of claims issued by the U.S.P.T.O., other steps could be envisioned. For example, a claim to a composition comprising components A and B would be infringed by a composition containing A and B but to which any number of other, unspecified components had been added. Similarly, a claim to a method comprising steps A and B would be infringed by a process involving steps A and B, regardless of whether steps C and D were later carried out. However, what is relevant under 35 U.S.C. §112, second paragraph, is that one of skill in the art be able to understand the metes and bounds of what is claimed when the claim is given its plain meaning. Appellants submit the claim has been given a strained hypothetical meaning inconsistent with the plain meaning of the wording of the claim.

The steps in the instantly claimed process of producing corn seed have been fully recited. All that is required to perform the recited process of producing corn seed is crossing first and second parent corn plants, wherein at least one of the plants is from corn variety I015011, and where seed is allowed to form. That hypothetical steps can be envisioned because of the use of the transition "comprising" does nothing to render the claim any less clear. Claims are read as written, not based on additional hypothetical steps or components.

With regard to the examiners statement that claim 22 further defines the method of claim 21 as a process of producing F1 hybrid corn seed, and thus claim 21 must include some other undefined steps, Appellants note that this is not the case. Claim 21 is not limited to crossing corn plant I015011 with itself. The claim is written in alternative form to include the situation where both parent plants are of corn variety I015011, as well as where one of the parents is a plant other than corn variety I015011. Claim 22 narrows this by specifying the situation to where only one parent corn plant is I015011. The claim is therefore fully definite and the addition of the

limitation of "F1" before "corn seed" in claim 21 as suggested by the examiner would be inconsistent with the language of the claim. In view of the foregoing, reversal of the rejection is respectfully requested.

B. The Written Description Rejection of Claims 3, 14, 21 and 24-31 Has Been Improperly Maintained

1. Essentially homogeneous populations of seed of variety I015011 and populations of plants grown therefrom recited in claims 3 and 14 have been fully described

The Action maintains the rejection of claim 3 as allegedly not describing essentially homogeneous populations of seed of corn variety I015011. Claim 3 reads as follows:

> 3. The population of seed of claim 2, further defined as an essentially homogeneous population of seed.

The Examiner has not alleged that the population of seed of claim 2 has not been fully described. As set forth above, claim 3 is a proper dependent claim that further defines claim 2. This is because a population, which is a group of individuals sharing a common characteristic, need not be substantially homogeneous. As the claim is dependent and more narrow than claim 2, the rejection is improper under 37 C.F.R. 1.75(c), which requires that dependent claims be read as including all of the limitations of the claim from which they depend. Claim 14, directed to an essentially homogeneous population of corn plants produced by growing the seed of the corn variety I015011, has similarly been described. As indicated above, "essentially homogeneous" properly modifies "population." The examiner has not alleged that populations of corn plants produced by growing the seed of the corn variety I015011 have not been described. Reversal of the rejections is thus respectfully requested.

2. Hybrid plants recited in claims 22-24 have been fully described

a. The claimed hybrid plants share the genetic complement of corn variety I015011

Rejected claims 22-24 are directed to hybrid plants and seeds produced with corn plant I015011 as one parent. Appellants have fully described this claimed subject matter in compliance with the written description requirement of 35 U.S.C. §112, first paragraph. As set forth in the breeding history at page 26 of the specification, corn plant I015011 is an inbred corn plant. All of the claimed hybrid plants having I015011 as a parent will therefore contain a copy of the same genome as corn plant I015011. That is, because I015011 is an inbred corn plant, hybrid corn plants derived therefrom will have as half of their genetic material the same genetic contribution of corn plant I015011, save the hypothetical possibility of the occasional spontaneous mutation or undetected segregating locus. This entire genetic contribution of corn plant I015011 is described in the specification by way of the deposit of seed of corn plant I015011 with the ATCC. *See Enzo Biochem, Inc. v. Gen-Probe Inc.*, 296 F.3d 1316, 1330 (Fed. Cir. 2002) (holding that a biological deposit constitutes a written description of the deposited material under 35 U.S.C. §112, first paragraph). This represents a description of concrete and identifiable structural characteristics defining the claimed hybrid plants and distinguishing them from other plants in full compliance with the written description requirement.

The Federal Circuit has noted that such shared identifiable structural features are important to the written description requirement. *The Regents of The University of California v. Eli Lilly and Co.*, 119 F.3d 1559, 1568; 43 USPQ2d 1398, 1406 (Fed. Cir. 1997) (noting that a name alone does not satisfy the written description requirement where "it does not define any structural features commonly possessed by members of the genus that distinguish them from others. One skilled in the art therefore cannot, *as one can do with a fully described genus,*

visualize or recognize the identity of the members of the genus" (emphasis added)). Here, all of the members of the claimed genus of hybrids having I015011 as one parent share the structural feature of having the genetic complement of I015011. One of skill in the art could thus readily identify the members of the genus. The written description requirement has, therefore, been fully complied with.

b. The shared characteristics of the claimed hybrid plants are readily identified and described in the specification

As set forth above, the claimed F1 hybrid plants having I015011 as one parent will share the same genetic complement received from I015011. This is readily identifiable by genetic marker analysis, as shown in Tables 5 and 7 of the specification. There shown is the SSR genetic marker profile of corn variety I015011, as well as an the exemplary hybrid plant designated 6017147 that was made using I015011 as one parent. As can be seen, hybrid corn plant 6017147 has the SSR genetic marker profile of I015011, and also includes the genetic markers from the second parent plant used to make the hybrid. The same will be true for any other hybrid plant having I015011 as one parent, save for an occasional difference at a locus due to spontaneous genetic rearrangements, which occur at statistically insignificant frequencies in essentially all organisms.

The second plant that is used to make the claimed hybrid plants is irrelevant, as a hybrid will be produced any time corn plant I015011 is crossed with a second plant. That is, any second plant capable of reproduction may be used to make the hybrid plant. Applicants cannot therefore be said to lack written description for the second genetic complement. This is particularly so given that hundreds or even thousands of different inbred corn lines were well known to those of skill in the art prior to the filing of the instant application, each of which could be crossed to make a hybrid plant within the scope of the claims. This is evidenced by a review of the

U.S.P.T.O. patent data website, which reveals utility patents issued on hundreds of different corn varieties. For example, a search of patents including "inbred corn line" in the title reveals more than 195 patents issued for corn varieties prior to the February 16, 2001 filing date of the current application; and a search for patents having "inbred maize line" in the title reveals more than 120 patents issued prior to February 16, 2001. Any one of these corn plants, or the many hundreds or thousands of other maize plants that were known at the time the application was filed, could be used to produce an F1 hybrid plant having corn variety I015011 as one parent, and each of these would share the genetic complement of I015011.

Written description is reviewed from the perspective of one of skill in the art at the time the application is filed. *Wang Labs., Inc. v. Toshiba Corp.*, 993 F.2d 858, 863 (Fed. Cir. 1993). The specification need not disclose what is well-known to those skilled in the art and preferably omits what is well-known and already available to the public. *In re Buchner*, 929 F.2d 660, 661 (Fed. Cir. 1991). As *any* second plant may be used to produce the claimed hybrid plants and such plants were well known to those of skill in the art, applicants cannot be said to have not been in possession of the second parent plant. The claimed hybrid corn plants have therefore been described in compliance with 35 U.S.C. §112, first paragraph.

The Action attempts to downplay the significance of the genetic marker data given in the specification by stating that some loci may be shared by other plants, that primer sequences are not described or that certain isozyme markers are not informative. However, no effort has been made to show that any substantial number of marker loci actually *are* shared by other plants. Further, Applicants do not claim such "other" plants, so this is irrelevant to written description. No basis has been provided to conclude that the claimed hybrid plants are not distinct and clearly identifiable by the genetic marker profile that has been set forth. Regarding the availability of

genetic markers, the service that was used to detect SSR markers is commercially available to the public. Further, SSR and any of the other genetic marker systems that are well known to those of skill in the art may potentially be used, as is described on pages 58-59 of the specification. Regardless of whether SSR markers are used, the shared genetic complement of the claimed hybrid plants having corn variety I015011 as one parent distinguishes them. As the entire genome of corn variety I015011 has been described, at least, by way of the seed deposit that has been made, any polymorphic locus could be used including or in addition to the more than 60 SSR markers shown in Tables 5 and 7.

c. The examiner's allegations that the expression of the genetic complement of corn variety I015011 is unpredictable are inapposite

The examiner alleges that claimed hybrid plants have not been described despite inheriting the genetic complement of variety I015011 because information is not provided regarding the morphological and physiological traits of the hybrid plants. It is alleged that how the genes that are inherited would be expressed or would interact has not been shown. However, this misses the point that applicants have gone one step further than morphological and physiological traits by describing the claimed hybrid plants at the genetic level. A better description could not be made than at the genetic level. Morphological and physiological traits, while helpful, are also subject to environmental variation and require subjective gradations. Genetic testing goes to the source of traits and yields concrete values.

The law further makes no distinctions regarding the manner in which applicants choose to describe claimed compositions. Rather, an applicant must merely describe the claimed subject matter by "whatever characteristics sufficiently distinguish it." *Amgen v. Chugai Pharmaceutical*, 927 F.2d 1200, 1206 (Fed. Cir. 1991). Here, Applicants have described the genetic complement of parent plant I015011 that will be comprised in the claimed hybrid plants.

This has been achieved using the SSR and isozyme genetic marker profiles given in tables 5-8 of the specification. Indeed, applicants describe the entire genetic complement of parent plant I015011 by way of a seed deposit made with the ATCC. *Enzo Biochem, Inc. v. Gen-Probe Inc.*, 296 F.3d 1316, 1330 (Fed. Cir. 2002).

d. Applicants fully describe an exemplary hybrid made using inbred I015011

Further description of claimed hybrid plants is also provided in the specification by way of a detailed description of hybrid 6017147, which was produced with I015011 as one inbred parent. This plant is representative of hybrids produced using I015011 as one parent, each of which comprise the genetic complement of the parent corn plant as set forth above. Table 4 of the specification gives the performance characteristics for 6017147 and provides comparisons against other hybrid varieties. In Table 5, the morphological traits of 6017147 are given. The SSR and isozyme marker profiles for hybrid 6017147 are given in Tables 7 and 8, respectively. This information, combined with the descriptions of I015011 in the specification and the shared structure among hybrids having corn plant I015011 as a parent, is more than adequate to describe the claimed subject matter.

3. Single locus converted plants of corn variety I015011 have been fully described

The examiner has maintained the rejection of claims 27-30, which are directed to a single locus conversion of corn plant I015011. In particular, the examiner has alleged that: (1) the characteristics of the claimed single locus converted plant are unpredictable and/or not described, (2) the claims encompass genes that have yet to be discovered, and (3) the sequences and/or sources for the numerous examples of single locus traits disclosed in the application have not been described.

a. The claimed subject matter is not unpredictable

With regard to the first point made by the examiner, it is noted that a "single locus converted (conversion) plant" is defined at page 23, lines 6-12 of the specification as follows:

> [p]lants which are developed by a plant breeding technique called backcrossing wherein essentially all of the desired morphological and physiological characteristics of an inbred are recovered in addition to the characteristics conferred by the single locus transferred into the inbred *via* the backcrossing technique. A single locus may comprise one gene, or in the case of transgenic plants, one or more transgenes integrated into the host genome at a single site (locus).

Therefore, the claimed plants comprising a single locus conversion possess "essentially all of the desired morphological and physiological characteristics of [the single gene converted plant]". The examiner's comments with regard to various allegedly unknown characteristics are thus outside the scope of the claims. With regard to the claimed subject matter, Appellants have more than adequately described such a plant that comprises essentially all of the desired morphological and physiological characteristics of corn plant I015011 by way of the description and deposit of I015011 alone, not to mention other description provided. To hold otherwise would be to limit Appellants to that subject matter described *ipsis verbis* in the specification. This position is expressly contradictory to Federal Circuit precedent. *In re Gosteli*, 872 F.2d 1008, 1012, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989) (stating that the written description requirement does not require an applicant to "describe exactly the subject matter claimed, [instead] the description must clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed" (citations omitted)) .

b. The examiner has applied the written description requirement with respect to unclaimed subject matter

With respect to the examiner's allegation that the claims encompass genes that have yet to be discovered, it is noted that Applicants ***do not claim undiscovered genes***. The claimed

subject matter is the corn variety I015011 comprising a single locus conversion. Any single locus conversion may be introduced into corn variety I015011 to produce the claimed single locus conversion. The fact that a given gene could be isolated in the future and introduced as a single locus conversion is irrelevant – the new gene is not claimed *per se*, a single locus conversion of corn plant I015011 is claimed. Under the reasoning of the examiner, essentially any claim could be read to encompass subject matter yet to be invented and therefore not be described. A claim to a corn plant transformed with a *Bacillus thuringiensis* gene would be invalid because it would encompass corn varieties yet to be discovered. A claim to a given gene operably linked to a regulatory element would be invalid because as yet to be isolated regulatory elements would be encompassed. In fact, nearly any biotechnological invention could be viewed this way applying the examiner's reasoning. The examiner has thus missed the point – which is that it is not any given single locus that is claimed, it is a corn plant of corn variety I015011 which comprises a single locus that has been claimed.

c. Applicants have disclosed numerous single locus traits and such traits were well known to those of skill in the art when the application was filed

The examiner alleges that the traits recited in the application and referred to in Appellants previous response to office action have not been shown to have been known in the art. The examiner has therefore invited Appellants to amend the claims to recite individual examples of single locus traits "provided the prior art teaches that those types of genes have been isolated and therefore reduced to practice." However, the examiner has ignored Appellants previous evidence submitted in the prior response to office action and also recited in the specification showing numerous single locus traits that were described.

Among just the examples in the specification recited with a publication reference or patent number are the following (see specification at pages 29-34): genes conferring male

sterility (U.S. Patent No. 3,861,709, U.S. Patent No. 3,710,511, U.S. Patent No. 4,654,465, U.S. Patent No 5,625,132, and U.S. Patent No. 4,727,219, incorporated by reference); male-sterility restorer genes (U.S. Patent Nos. 5,530,191, 5,689,041, 5,741,684, and 5,684,242, incorporated by reference); a herbicide resistant EPSPS mutation termed *aroA* (U.S. Patent 4,535,060); and a mutant maize gene encoding a protein with amino acid changes at residues 102 and 106 (PCT Publication WO 97/04103).

The single locus traits are also described by way of PCT Application Publ. WO 95/06128, which was specifically incorporated by reference at page 31 of the specification. Examples of some of the single locus traits described in WO 95/06128, including any associated phenotype and publication reference given, are as follows:

the uidA gene from *E. Coli* encoding β-glucuronidase (GUS) (cells expressing *uidA* produce a blue color when given the appropriate substrate, Jefferson, R.A. 1987. *Plant Mol. Biol. Rep* 5: 387-405); the *bar* gene from *Streptomyces hygroscopicus* encoding phosphinothricin acetyltransferase (PAT) (cells expressing PAT are resistant to the herbicide Basta, White, J., Chang, S.-Y.P., Bibb, M.J., and Bibb, M.J. 1990. *Nucl. Ac. Research* 18: 1062); the *lux* gene from firefly encoding luciferase (cells expressing *lux* emit light under appropriate assay conditions, deWet, J.R., Wood, K.V., DeLuca, M., Helinski, D.R., Subramani, S. 1987. *Mol. Cell. Biol.* 7: 725-737); the *dhfr* gene from mouse encoding dihydrofolate reductase (DHFR) (cells expressing *dhfr* are resistant to methotrexate; Eichholtz, D.A., Rogers, S.G., Horsch, R.B., Klee, H.J., Hayford, M., Hoffman, N.L., Bradford, S.B., Fink, C., Flick, J., O'Connell, K.M., Frayley, R.T. 1987. *Somatic Cell Mol. Genet.* 13: 67-76); the *neo* gene from *E.Coli* encoding aminoglycoside phosphotransferase (APH) (cells expressing *neo* are resistant to the aminoglycoside antibiotics; Beck, E., Ludwig, G., Auerswald, E.A., Reiss, B., Schaller, H. 1982. *Gene* 19: 327-336); the *amp* gene from *E. Coli* encoding β-lactamase (cells expressing β-lactamase produce a chromogenic compound when given the appropriate substrate; Sutcliffe, J.G. 1978. *Proc. Nat. Acad. Sci.* USA 75: 3737-3741); the *xylE* gene from *Ps. putida* encoding catechol dihydroxygenase (cells expressing *xylE* produce a chromogenic compound when given the appropriate substrate; Zukowsky *et al.* 1983. *Proc. Nat. Acad. Sci.* USA 80: 1101-1105); the R,C1 and B genes from maize encode proteins that regulate anthocyanin biosynthesis in maize (Goff, S., Klein, T., Ruth, B., Fromm, M., Cone, K., Radicella, J., Chandler, V. 1990. *EMBO J.:* 2517-2522); the ALS gene from *Zea mays* encoding acetolactate synthase and mutated to confer resistance to sulfonylurea herbicides (cells expressing ALS are resistant to the herbicide; Gleen. Yang, L.Y., Gross, P.R., Chen, C.H., Lissis, M. 1992. *Plant Molecular Biology* 18: 1185-1187); the proteinase inhibitor II gene from potato and tomato (plants expressing the proteinase inhibitor II gene show increased resistance to insects; potato - Graham, J.S., Hall, G., Pearce, G., Ryan, C.A. 1986 *Mol. Cell. Biol.* 2: 1044-1051; tomato - Pearce, G.,

Strydom, D., Johnson, S., Ryan, C.A. 1991. *Science* 253: 895-898); the *Bt* gene from *Bacillus thuringensis* berliner 1715 encoding a protein that is toxic to insects (this gene is the coding sequence of *Bt* 884 modified in two regions for improved expression in plants; Vaeck, M., Reynaerts, A., Hofte, H., Jansens, S., DeBeuckeleer, M., Dean, C., Aeabeau, M., Van Montagu, M., and Leemans, J. 1987. *Nature* 328: 33-37); the *bxn* gene from *Klebsiella ozaeneae* encoding a nitrilase enzyme specific for the herbicide bromoxynil (cells expressing this gene are resistant to the herbicide bromoxynil; Stalker, D.m., McBride, K.E., and Malyj, L. *Science* 242: 419-422, 1988); the WGA-A gene encoding wheat germ agglutinin (expression of the WGA-A gene confers resistance to insects; Smith, J.J., Raikhel, N.V. 1989. *Plant Mol. Biology* 13: 601-603); the *dapA* gene from *E. coli* encoding dihydrodipicolinate synthase (expression of this gene in plant cells produces increased levels of free lysine; Richaud, F., Richaud, C., Rafet, P. and Patte, J.C. 1986. *J. Bacteriol.* 166: 297-300); the *Z10* gene encoding a 10kd zein storage protein from maize (expression of this gene in cells alters the quantities of 10kD Zein in the cells; Kirihara, J.A., Hunsperger, J.P., Mahoney, W.C., and Messing, J. 1988. *Mol. Gen. Genet.* 211: 477-484); the Bt gene cloned from *Bacillus thuringensis* Kurstaki encoding a protein that is toxic to insects (the gene is the coding sequence of the cry IA(c) gene modified for improved expression in plants - plants expressing this gene are resistant to insects; Höfte, H. and Whiteley, H.R., 1989. *Microbiological Reviews.* 53: 242-255); the ALS gene from *Arabidopsis thaliana* encoding a sulfonylurea herbicide resistant acetolactate synthase enzyme (cells expressing this gene are resistant to the herbicide Gleen. Haughn, G.W., Smith, J., Mazur, B., and Somerville, C. 1988. *Mol. Gen. Genet.* 211: 266-271); the *deh1* gene from *Pseudomonas putida* encoding a dehalogenase enzyme (cells expressing this gene are resistant to the herbicide Dalapon; Buchanan-Wollaston, V., Snape, A., and Cannon, F. 1992. *Plant Cell Reports* 11: 627-631); the hygromycin phosphotransferase II gene from *E. coli* (expression of this gene in cells produces resistance to the antibiotic hygromycin. Waldron, C., Murphy, E.B., Roberts, J.L., Gustafson, G.D., Armour, S.L., and Malcolm, S.K. *Plant Molecular Biology* 5: 103-108, 1985); the *mtlD* gene cloned from *E. coli* (the gene encodes the enzyme mannitol-1-phosphate dehydrogenase; Lee and Saier, 1983. *J. of Bacteriol.* 153:685); the HVA-1 gene encoding a Late Embryogenesis Abundant (LEA) protein (the gene was isolated from barley; Dure, L., Crouch, M., Harada, J., Ho, T.-H. D. Mundy, J., Quatrano, R, Thomas, T, and Sung, R., *Plant Molecular Biology* 12: 475-486.

The foregoing represent just some of the single locus coding sequences that were know as of March 2, 1995; ***nearly six years prior*** to the filing of the instant application. More than 25 regulatory elements were also described therein as were numerous transformation vectors comprising combinations of these elements. Appellants could describe many more examples of single locus traits that were well known as of the filing date, and would be glad to do so should the Board find it useful. It thus goes without saying that single locus traits were more than well known to those of skill in the art as of the filing date and were described in the specification.

Techniques for the introduction of single locus traits by genetic transformation were further well known to those of skill in the art. Some of the transformation methods for corn that were well known as of the filing date include the following: electroporation (U.S. Patent No. 5,384,253), microprojectile bombardment (U.S. Patent No. 5,550,318; U.S. Patent No. 5,736,369, U.S. Patent No. 5,538,880; and PCT Publication WO 95/06128), *Agrobacterium*-mediated transformation (U.S. Patent No. 5,591,616 and E.P. Publication EP672752), direct DNA uptake transformation of protoplasts (Omirulleh *et al.*, 1993) and silicon carbide fiber-mediated transformation (U.S. Patent No. 5,302,532 and U.S. Patent No. 5,464,765). Introduction of such traits by conventional breeding was also known. In fact, this is one of the most fundamental procedures in agricultural science, and it has not been alleged that this has not been described.

It may therefore not reasonably be alleged that Appellants were not in possession of single locus conversions. Both large numbers of single locus traits and the associated phenotypes were well known to those of skill in the art. The specification itself defines a single locus converted plant as comprising essentially all of the desired morphological and physiological characteristics of the starting non-converted plant, *e.g.*, I015011. Well more than an adequate number of examples have been provided and were known in the art to satisfy written description. The state of the art must be considered in the written description determination. As such, Appellants have fully complied with the written description requirement and reversal of the rejection under 35 U.S.C. §112, first paragraph, is respectfully requested.

4. The rejection of claims 21 and 31 has been improperly issued and maintained

a. The examiner has failed to explain or support the rejections

Claims 21 and 31 are process claims that involve crossing corn variety I015011 according to the specified step(s). Appellants understand from a telephonic interview held in co-

pending serial number 09/788,334, which has claims that are substantially identical to the current case and received substantially identical rejections, that it is the position of the examiner that written description must be provided for each intermediate product in a method claim in the same manner as if the particular product was individually claimed as a composition of matter. That is, Appellants understand that the position taken is that it is not sufficient to describe all of the starting materials for a process and all of the steps carried out on the starting materials, but rather that the structural characteristics of any product made at any intermediate or penultimate step must be described as if claimed as a composition of matter. Appellants submit that this is a misstatement of the law and, more significantly, note that this rejection has not been set forth on the record. No basis in law or fact has been given for maintaining the rejection, as the examiner's arguments appear to be entirely directed to composition of matter claims.

Findings of fact and conclusions of law by the U.S. Patent and Trademark Office must be made in accordance with the Administrative Procedure Act ("APA"). 5 U.S.C. § 706(A), (E), 1994; *see also In re Zurko,* 59 USPQ 2d 1693 (Fed. Cir. 2001). In particular, the Federal Circuit has held that findings by the Board of Patent Appeals and Interferences must be supported by "substantial evidence" within the record pursuant to the APA. *See In re Gartside*, 203 F.3d 1305, 1314-15 (Fed. Cir. 2000). Thus, an Examiner's position on Appeal must be supported by "substantial evidence" within the record in order to be upheld by the Board of Patent Appeals and Interferences. The current rejections are completely unsupported in fact or law. The standards of the APA have therefore not been met and reversal of the rejection is thus respectfully requested.

b. The rejection of claim 21 is improper

The examiner has maintained the rejection of claim 21, although the basis for doing so has not been explained. Claim 21 reads as follows:

> 21. A process of producing corn seed, comprising crossing a first parent corn plant with a second parent corn plant, wherein one or both of the first or the second parent corn plant is a plant of the corn variety I015011, wherein a sample of the seed of the corn variety I015011 was deposited under ATCC Accession No. PTA-3228, wherein seed is allowed to form.

As can be seen, all that the claim requires for completion is crossing a plant of the corn variety I015011 with itself, including another plant of variety I015011, or any second variety and allowing seed to form. Crossing corn variety I015011 with a second plant is specified in dependent claim 22. In claim 21, either one or both of the parent plants may be from the corn variety I015011. It has not been alleged that corn variety I015011 is not fully described, thus it is assumed that the rejection is made with regard to crossing variety I015011 to a second plant as required in claim 22. However, ***any second plant*** may be used in the claimed process to produce corn seed, as corn seed production is the natural result of crossing (*e.g.*, fertilization), whether self-fertilization or by a second plant.

It may not reasonably be alleged that Appellants were not in possession of ***any*** second corn plant. It is a gross understatement to say that corn plants in general were not known in the art. As mentored above, merely by doing a cursory search of the U.S.P.T.O. website, more than 300 issued utility patents for different corn varieties were available prior to the filing date of the instant application, each of which has presumably been made available to the public in compliance with 35 U.S.C. §112, first paragraph. Still further, the application describes a working example of the claimed method, both by way of crossing variety I015011 to a second plant to produce exemplary hybrid 6017147, and by way of selfing to produce additional seed of variety I015011 as set forth in the breeding history provided in the application. Appellants thus respectfully submit that no basis exists for the rejection and reversal thereof is respectfully requested.

c. The rejection of claim 31 is improper

The examiner has maintained the rejection of claim 31, although no basis for doing so has been provided. Claim 31 reads as follows:

31. A method of producing an inbred corn plant derived from the corn variety I015011, the method comprising the steps of:

(a) preparing a progeny plant derived from corn variety I015011 by crossing a plant of the corn variety I015011 with a second corn plant, wherein a sample of the seed of the corn variety I015011 was deposited under ATCC Accession No. PTA-3228;

(b) crossing the progeny plant with itself or a second plant to produce a seed of a progeny plant of a subsequent generation;

(c) growing a progeny plant of a subsequent generation from said seed and crossing the progeny plant of a subsequent generation with itself or a second plant; and

(d) repeating steps (b) and (c) for an addition 3-10 generations to produce an inbred corn plant derived from the corn variety I015011.

As set forth above, it is believed that the rejection is made based on the position that each product produced at any intermediate or penultimate step of the method must be described as if claimed. It is respectfully submitted that this is a misstatement of the law. What is required to meet the written description requirement is that an Applicant show that he or she was in possession of the ***claimed invention***. *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64 (Fed. Cir. 1991). Here, a process is claimed, not a product of a process, and thus the steps of that process must be described, not any intermediate or final product of the steps. The starting materials for the process must also be provided, otherwise the process could not be completed. However, the only starting materials required are corn variety I015011, which the examiner does not allege to have not been described, and ***any*** second corn plant. As set forth above, corn plants were well known, and this has also therefore been fully described.

With respect to the steps, these have been fully set forth in the claim. It has not been alleged that any essential steps are absent. All that is required to complete the claimed method is to cross the corn variety I015011 or a product that is produced by any preceding step according

to the steps given. Further, all of the products used within the method are either (1) corn variety I015011, (2) any second corn plant, or (3) a corn plant that is produced by following a preceding method step. The method has therefore been fully described.

It is also noted that corn breeding is a skill well known to those of skill in the art. Without it, there would not be commercial corn varieties, which are typically sold as hybrids produced by crossing two inbred varieties. This is evidenced by the more than 300 issued patents to inbred maize varieties discussed above, given that inbred plants are not produced without multiple generations of intentional self-fertilization. All of the steps recited in claim 31 are typical of the process used for the production of new corn varieties, save for the point of novelty, corn variety I015011. This is evidenced in the breeding history for the production of corn variety I015011, which is given in the specification. The specification also describes methods and considerations for producing new corn varieties in the review of related art, for example, at pages 2-4 of the application.

In conclusion, all steps of the claimed process have been recited, all starting materials have been fully described, and methods of producing new corn varieties were well known to those of skill in the art. Claim 31 has therefore been fully described in compliance with 35 U.S.C. §112, first paragraph. Reversal of the rejection is thus respectfully requested.

X. CONCLUSION

It is respectfully submitted, in light of the above, none of the pending claims lack written description. Therefore, Appellants request that the Board reverse the pending grounds for rejection.

Respectfully submitted,

Robert E. Hanson
Reg. No. 42,628
Attorney for Appellants

FULBRIGHT & JAWORSKI L.L.P
600 Congress Avenue, Suite 2400
Austin, Texas 78701
(512) 536-3085

Date: June 30, 2003

APPENDIX 1: PENDING CLAIMS FOLLOWING ENTRY OF THE AMENDMENT UNDER 37 C.F.R. §1.116

1. A seed of the corn variety I015011, wherein a sample of the seed of the corn variety I015011 was deposited under ATCC Accession No. PTA-3228.

2. A population of seed of the corn variety I015011, wherein a sample of the seed of the corn variety I015011 was deposited under ATCC Accession No. PTA-3228.

3. The population of seed of claim 2, further defined as an essentially homogeneous population of seed.

5. A corn plant produced by growing a seed of the corn variety I015011, wherein a sample of the seed of the corn variety I015011 was deposited under ATCC Accession No. PTA-3228.

6. The corn plant of claim 5, having:
   (a) an SSR profile in accordance with the profile shown in Table 6; or
   (b) an isozyme typing profile in accordance with the profile shown in Table 7.

7. A plant part of the corn plant of claim 5.

8. The plant part of claim 7, further defined as pollen.

9. The plant part of claim 7, further defined as an ovule.

10. The plant part of claim 7, further defined as a cell.

11. The plant part of claim 10, wherein said cell is further defined as having :
   (a) an SSR profile in accordance with the profile shown in Table 6; or
   (b) an isozyme typing profile in accordance with the profile shown in Table 7.

12. A seed comprising the cell of claim 10.

13. A tissue culture comprising the cell of claim 10.

14. An essentially homogeneous population of corn plants produced by growing the seed of the corn variety I015011, wherein a sample of the seed of the corn variety I015011 was deposited under ATCC Accession No. PTA-3228.

15. A corn plant capable of expressing all the physiological and morphological characteristics of the corn variety I015011, wherein a sample of the seed of the corn variety I015011 was deposited under ATCC Accession No. PTA-3228.

16. The corn plant of claim 15, further comprising a nuclear or cytoplasmic gene conferring male sterility.

17. A tissue culture of regenerable cells of a plant of corn variety I015011, wherein the tissue is capable of regenerating plants capable of expressing all the physiological and morphological characteristics of the corn variety I015011, wherein a sample of the seed of the corn variety I015011 was deposited under ATCC Accession No. PTA-3228.

18. The tissue culture of claim 17, wherein the regenerable cells comprise cells derived from embryos, immature embryos, meristematic cells, immature tassels, microspores, pollen, leaves, anthers, roots, root tips, silk, flowers, kernels, ears, cobs, husks, or stalks.

19. The tissue culture of claim 18, wherein the regenerable cells comprise protoplasts or callus cells.

20. A corn plant regenerated from the tissue culture of claim 17, wherein the corn plant is capable of expressing all of the physiological and morphological characteristics of the corn variety designated I015011, wherein a sample of the seed of the corn variety I015011 was deposited under ATCC Accession No. PTA-3228.

21. A process of producing corn seed, comprising crossing a first parent corn plant with a second parent corn plant, wherein one or both of the first or the second parent corn plant is a plant of the corn variety I015011, wherein a sample of the seed of the corn variety I015011 was deposited under ATCC Accession No. PTA-3228, wherein seed is allowed to form.

22. The process of claim 21, further defined as a process of producing F1 hybrid corn seed, comprising crossing a first inbred corn plant with a second, distinct inbred corn plant, wherein

the first or second inbred corn plant is a plant of the corn variety I015011, wherein a sample of the seed of the corn variety I015011 was deposited under ATCC Accession No. PTA-3228.

23. The process of claim 22, wherein crossing comprises the steps of:

(a) planting the seeds of first and second inbred corn plants;

(b) cultivating the seeds of said first and second inbred corn plants into plants that bear flowers;

(c) preventing self pollination of at least one of the first or second inbred corn plant;

(d) allowing cross-pollination to occur between the first and second inbred corn plants; and

(e) harvesting seeds on at least one of the first or second inbred corn plants, said seeds resulting from said cross-pollination.

24. Hybrid corn seed produced by the process of claim 23.

25. A hybrid corn plant produced by growing a seed produced by the process of claim 23.

26. The hybrid corn plant of claim 25, wherein the plant is a first generation (F_1) hybrid corn plant.

27. The corn plant of claim 5, further defined as having a genome comprising a single locus conversion.

28. The corn plant of claim 27, wherein the single locus was stably inserted into a corn genome by transformation.

29. The corn plant of claim 27, wherein the locus is selected from the group consisting of a dominant allele and a recessive allele.

30. The corn plant of claim 27, wherein the locus confers a trait selected from the group consisting of herbicide tolerance; insect resistance; resistance to bacterial, fungal, nematode or viral disease; yield enhancement; waxy starch; improved nutritional quality; enhanced yield stability; male sterility and restoration of male fertility.

31. A method of producing an inbred corn plant derived from the corn variety I015011, the method comprising the steps of:

(a) preparing a progeny plant derived from corn variety I015011 by crossing a plant of the corn variety I015011 with a second corn plant, wherein a sample of the seed of the corn variety I015011 was deposited under ATCC Accession No. PTA-3228;

(b) crossing the progeny plant with itself or a second plant to produce a seed of a progeny plant of a subsequent generation;

(c) growing a progeny plant of a subsequent generation from said seed and crossing the progeny plant of a subsequent generation with itself or a second plant; and

(d) repeating steps (b) and (c) for an addition 3-10 generations to produce an inbred corn plant derived from the corn variety I015011.

APPENDIX 2: CLAIMS ON APPEAL FOLLOWING ENTRY OF THE AMENDMENT UNDER 37 C.F.R. §1.116

3. The population of seed of claim 2, further defined as an essentially homogeneous population of seed.

4. The population of seed of claim 2, further defined as essentially free from hybrid seed.

14. An essentially homogeneous population of corn plants produced by growing the seed of the corn variety I015011, wherein a sample of the seed of the corn variety I015011 was deposited under ATCC Accession No. PTA-3228.

21. A process of producing corn seed, comprising crossing a first parent corn plant with a second parent corn plant, wherein one or both of the first or the second parent corn plant is a plant of the corn variety I015011, wherein a sample of the seed of the corn variety I015011 was deposited under ATCC Accession No. PTA-3228, wherein seed is allowed to form.

24. Hybrid corn seed produced by the process of claim 23.

25. A hybrid corn plant produced by growing a seed produced by the process of claim 23.

26. The hybrid corn plant of claim 25, wherein the plant is a first generation (F_1) hybrid corn plant.

27. The corn plant of claim 5, further defined as having a genome comprising a single locus conversion.

28. The corn plant of claim 27, wherein the single locus was stably inserted into a corn genome by transformation.

29. The corn plant of claim 27, wherein the locus is selected from the group consisting of a dominant allele and a recessive allele.

30. The corn plant of claim 27, wherein the locus confers a trait selected from the group consisting of herbicide tolerance; insect resistance; resistance to bacterial, fungal, nematode or

viral disease; yield enhancement; waxy starch; improved nutritional quality; enhanced yield stability; male sterility and restoration of male fertility.

31. A method of producing an inbred corn plant derived from the corn variety I015011, the method comprising the steps of:

(a) preparing a progeny plant derived from corn variety I015011 by crossing a plant of the corn variety I015011 with a second corn plant, wherein a sample of the seed of the corn variety I015011 was deposited under ATCC Accession No. PTA-3228;

(b) crossing the progeny plant with itself or a second plant to produce a seed of a progeny plant of a subsequent generation;

(c) growing a progeny plant of a subsequent generation from said seed and crossing the progeny plant of a subsequent generation with itself or a second plant; and

(d) repeating steps (b) and (c) for an addition 3-10 generations to produce an inbred corn plant derived from the corn variety I015011.

APPENDIX 3: CLAIMS ON APPEAL WITHOUT ENTRY OF THE AMENDMENT UNDER 37 C.F.R. §1.116

3. The population of seed of claim 2, further defined as an essentially homogeneous population of seed.

4. The population of seed of claim 2, further defined as essentially free from hybrid seed.

14. An essentially homogeneous population of corn plants produced by growing the seed of the corn variety I015011, wherein a sample of the seed of the corn variety I015011 was deposited under ATCC Accession No. PTA-3228.

21. A process of producing corn seed, comprising crossing a first parent corn plant with a second parent corn plant, wherein one or both of the first or the second parent corn plant is a plant of the corn variety I015011, wherein a sample of the seed of the corn variety I015011 was deposited under ATCC Accession No. PTA-3228, wherein seed is allowed to form.

24. Hybrid corn seed produced by the process of claim 23.

25. A hybrid corn plant produced by growing a seed produced by the process of claim 23.

26. The hybrid corn plant of claim 25, wherein the plant is a first generation (F_1) hybrid corn plant.

27. The corn plant of claim 5, further defined as having a genome comprising a single locus conversion.

28. The corn plant of claim 27, wherein the single locus was stably inserted into a corn genome by transformation.

29. The corn plant of claim 27, wherein the locus is selected from the group consisting of a dominant allele and a recessive allele.

30. The corn plant of claim 27, wherein the locus confers a trait selected from the group consisting of herbicide tolerance; insect resistance; resistance to bacterial, fungal, nematode or

viral disease; yield enhancement; waxy starch; improved nutritional quality; enhanced yield stability; male sterility and restoration of male fertility.

31. A method of producing an inbred corn plant derived from the corn variety I015011, the method comprising the steps of:

(a) preparing a progeny plant derived from corn variety I015011 by crossing a plant of the corn variety I015011 with a second corn plant, wherein a sample of the seed of the corn variety I015011 was deposited under ATCC Accession No. PTA-3228;

(b) crossing the progeny plant with itself or a second plant to produce a seed of a progeny plant of a subsequent generation;

(c) growing a progeny plant of a subsequent generation from said seed and crossing the progeny plant of a subsequent generation with itself or a second plant; and

(d) repeating steps (b) and (c) for an addition 3-10 generations to produce an inbred corn plant derived from the corn variety I015011.

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Main Entry: **pop·u·la·tion**
Pronunciation: `"pä-py&-'lA-sh&n`
Function: *noun*
Etymology: Late Latin *population-, populatio,* from Latin *populus*
Date: 1612
1 a : the whole number of people or inhabitants in a country or region **b :** the total of individuals occupying an area or making up a whole **c :** the total of particles at a particular energy level -- used especially of atoms in a laser
2 : the act or process of populating
3 a : a body of persons or individuals having a quality or characteristic in common **b** (1) **:** the organisms inhabiting a particular locality (2) **:** a group of interbreeding organisms that represents the level of organization at which speciation begins
4 : a group of individual persons, objects, or items from which samples are taken for statistical measurement
- **pop·u·la·tion·al** `/-shn&l, -sh&-n&l/` *adjective*

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Pronunciation Symbols

Click on the example word to hear it pronounced.

\&\ as **a** and **u** in abut	\e\ as **e** in bet	\o\ as **aw** in law
\ᵊ\ as **e** in kitten	\E\ as **ea** in easy	\oi\ as **oy** in boy
\&r\as **ur/er** in further	\g\ as **g** in go	\th\ as **th** in thin
\a\ as **a** in ash	\i\ as **i** in hit	\th\ as **th** in the
\A\ as **a** in ace	\Ī\ as **i** in ice	\ü\ as **oo** in loot
\ä\ as **o** in mop	\j\ as **j** in job	\u\ as **oo** in foot
\au\ as **ou** in out	\[ng]\ as **ng** in sing	\y\ as **y** in yet
\ch\ as **ch** in chin	\O\ as **o** in go	\zh\ as **si** in vision

For more information see the Guide To Pronunciation.

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One entry found for **homogeneous**.

Main Entry: **ho·mo·ge·neous**
Pronunciation: -'jE-nE-&s, -ny&s
Function: *adjective*
Etymology: Medieval Latin *homogeneus, homogenus,* from Greek *homogenEs,* from *hom-* + *genos* kind -- more at KIN
Date: 1641
1 : of the same or a similar kind or nature
2 : of uniform structure or composition throughout <a culturally *homogeneous* neighborhood>
3 : having the property that if each variable is replaced by a constant times that variable the constant can be factored out **:** having each term of the same degree if all variables are considered <a *homogeneous* equation>
- **ho·mo·ge·neous·ly** *adverb*
- **ho·mo·ge·neous·ness** *noun*

Pronunciation Symbols

Click on the example word to hear it pronounced.

\&\ as **a** and **u** in abut	\e\ as **e** in bet	\o\ as **aw** in law
\ᵊ\ as **e** in kitten	\E\ as **ea** in easy	\oi\ as **oy** in boy
\&r\as **ur/er** in further	\g\ as **g** in go	\th\ as **th** in thin
\a\ as **a** in ash	\i\ as **i** in hit	\th\ as **th** in the
\A\ as **a** in ace	\I\ as **i** in ice	\ü\ as **oo** in loot
\ä\ as **o** in mop	\j\ as **j** in job	\u\ as **oo** in foot
\au\ as **ou** in out	\[ng]\ as **ng** in sing	\y\ as **y** in yet
\ch\ as **ch** in chin	\O\ as **o** in go	\zh\ as **si** in vision

For more information see the Guide To Pronunciation.

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